

What Is Claimed Is:

Sub A1
1. Apparatus for treating an interior region of a cardiac chamber, the apparatus comprising:
a catheter configured for insertion into a cardiac chamber, the catheter having a deflectable end region;

an end effector disposed within the deflectable end region, the end effector adapted to form a needle track at a treatment site in an interior region of the cardiac chamber, the end effector movable between a first position, wherein the end effector is retracted within the end region, and a second position, wherein the end effector is extended beyond a distal endface of the catheter; and

means for moving the end region between the first and second positions.

2. The apparatus of claim 1 wherein the end effector comprises a non-coring sharpened tip.

3. The apparatus of claim 1 wherein the end effector further comprises an electrode adapted to deliver RF energy to the treatment site.

4. The apparatus of claim 3 wherein the end effector further comprises means for depositing a controlled amount of a bioactive agent at the treatment site.

5. The apparatus of claim 1 wherein the end effector further comprises means for depositing a controlled amount of a bioactive agent at the treatment site.

4
6. The apparatus of claim 1 wherein the end effector further comprises a plurality of fine wires, the fine wires movable between a retracted position and an extended position, the plurality of fine wires forming a matrix of additional needle tracks at the treatment site when extended.

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7. The apparatus of claim 1 wherein the end effector is coupled to a drive shaft, the apparatus further comprising a controller including a hydraulic mechanism coupled to the drive shaft to extend and retract the end effector.

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8. The apparatus as defined in claim 1 wherein the end effector is coupled to a drive shaft, the apparatus further comprising a controller including a pneumatic mechanism coupled to the drive shaft to extend and retract the end effector.

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9. The apparatus as defined in claim 1 wherein the end effector is coupled to a drive shaft, the apparatus further comprising a manually actuated mechanism coupled to the drive shaft to extend and retract the end effector.

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10. Apparatus for treating an interior region of a cardiac chamber, the apparatus comprising:
a catheter having a deflectable end region;
an end effector adapted to form a needle track at a treatment site in an interior region of the cardiac chamber, the end effector movable between a first position, wherein the end effector is retracted within the end region, and a second position, wherein the end effector is extended beyond a distal endface of

the catheter; and

means for depositing a bioactive agent in the needle track when the end effector is in the second position.

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9 ~~11~~. The apparatus of claim ~~10~~ wherein the end effector comprises a non-coring sharpened tip.

¹⁰ ⁸
~~12~~. The apparatus of claim ~~10~~ wherein the end effector further comprises an electrode adapted to deliver RF energy to the treatment site.

¹¹ ¹⁰
~~13~~. The apparatus of claim ~~12~~ wherein the bioactive agent is a fluid and the means for depositing comprises supplies the fluid to the end effector under pressure.

¹² ⁸
~~14~~. The apparatus of claim ~~10~~ wherein bioactive agent has a pellet form and the means for depositing the bioactive agent comprises a push rod.

Sub A2
~~15. A method of treating an interior region of a cardiac chamber comprising:~~

~~providing apparatus having a catheter adapted for insertion into a cardiac chamber, the catheter having a deflectable end region including an end effector adapted to form a needle track at a treatment site in an interior region of the cardiac chamber;~~

~~inserting the apparatus within a cardiac chamber;~~

~~deflecting the end region to dispose the end effector at a selected orientation relative to an endocardial surface; and~~

~~actuating the end effector to form a needle~~

track in an interior region of the cardiac chamber at a treatment site.

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16. The method of claim ¹³15 further comprising delivering RF energy to the treatment site to create a controlled depth of necrosis at the treatment site.

17. The method of claim 16 further comprising delivering a controlled amount of a bioactive agent at the treatment site.

18. The method of claim 15 further comprising delivering a controlled amount of a bioactive agent at the treatment site.

Sub A3
19. The method of claim 18 wherein delivering a controlled amount of a bioactive agent at the treatment site further comprises injecting the bioactive agent under pressure sufficient to form a pocket of bioactive agent in the tissue.

20. The method of claim 18 wherein delivering a controlled amount of a bioactive agent at the treatment site further comprises injecting a pellet comprising a bioactive agent.

¹⁷
21. The method as defined in claim ¹³15 wherein the end effector further comprises a plurality of fine wires, the fine wires movable between a retracted position and an extended position, the method further comprising extending the plurality of fine wires to form a matrix of additional needle tracks at the treatment site.

translating the end region to relocate the
end effector; and
repeating actuation of the end effector.

1. The first step is to identify the problem. This involves understanding the current situation and the goals that need to be achieved.